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**ADMITTED IN NEW YORK AND MASSACHUSETTS ONLY

November 22, 1996

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Room 222
Washington, DC 20554

Re: MM Docket No. 87-268

Dear Mr. Caton:

Transmitted herewith, on behalf of Appalachian Broadcasting Corporation, are an original and nine copies of its "Comments of Appalachian Broadcasting Corporation" filed in response to the Commission's Sixth Notice of Rulemaking in the above-referenced matter.

In the event there are any questions concerning this matter, please contact the undersigned.

Very truly yours,

Arthur B. Goodkind

Arthur B. Goodkind

Enclosure

No. of Copies rec'd 0+9
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Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Advanced Television Systems	)	
and Their Impact Upon the	)	MM Docket No. 87-268
Existing Television Broadcast	)	
Service	)	

TO: The Commission

COMMENTS OF APPALACHIAN BROADCASTING CORPORATION

Appalachian Broadcasting Corporation ("Appalachian"), licensee of television station WCYB-TV, Bristol, Virginia, files herewith, by its attorneys, its Comments in the above-captioned proceeding. For the reasons set forth below, Appalachian requests that the Commission allot Channel 9 as the DTV allotment paired with WCYB-TV when the Commission adopts its DTV Table of Allotments.

WCYB-TV's licensee, Appalachian, is a wholly owned subsidiary of Lamco Communications, Inc. ("Lamco"). Including WCYB-TV, Lamco is the owner of full-service television stations serving five smaller television markets: Bristol, Virginia-

Johnson City-Kingsport, Tennessee; Abilene-Sweetwater, Texas; Redding, California; Eureka-Arcato, California and Greenville-New Bern-Washington, North Carolina.

Four of the five Lamco stations are VHF. The paired DTV allotments provided for each of the Lamco stations in the Commission's proposed DTV Table of Allotments are all UHF channels, as are the DTV allotments specified in the Modified Table prepared by the Broadcasters Caucus. Lamco recognizes that most DTV allotments will of necessity be UHF and understands that UHF stations are predicted to be able to provide satisfactory DTV service in most situations. Accordingly Lamco has no broad, general objection to the UHF allotments proposed for its stations and is not requesting specifically that any of the allotments -- except for the WCYB-TV allotment -- be changed.

WYCB-TV's circumstances, however, are different and unique. Appalachian has now operated WCYB-TV for almost 20 years. Its long experience has provided it with a keen appreciation of an overriding topographic fact of life in the Bristol-Kingsport-Johnson City market, which is that the market is one of the most difficult, if not the most difficult, in the United States to

serve by over the air television. As shown in the attached Engineering Statement of Jules Cohen, P. E. (the "Engineering Statement"), most sectors of the market include extremely rough mountainous terrain. Not only does the market include some of the highest mountain peaks on the east coast, but the terrain in many areas consists generally of a continuing succession of steep slopes and deep valleys, with the predominant portion of the populated areas lying in the valleys.

These terrain problems cause significant difficulties for WCYB-TV in serving television homes located behind obstructions. An increase in the antenna height of WCYB-TV could help serve some areas that presently find direct reception difficult, but airspace restrictions have thus far made it impossible to secure FAA approval for any material increase in tower height. Many of WCYB-TV's viewers who live behind obstructions therefore receive the station's signal by diffraction -- that is, from signal rays that are "bent" over obstacles in their path. However, while diffraction enables a station to provide service beyond obstructions, diffraction produces a substantial loss of signal strength. That signal strength loss increases as a station's

transmitting frequency increases. See Engineering Statement, p. 2.

Even on a calculated basis, the UHF channel proposed for WCYB-TV by the Commission is only predicted to provide 91.2% replication of the station's present service area. That is a substantially lower replication percentage than is provided for any other station in WCYB-TV's market. Owing to the much higher signal losses that would occur when a UHF signal is diffracted, however (as compared with a diffracted VHF signal), the actual replication percentage would likely be even lower, even if the station were to broadcast with the full 3131.7 kw power assumed by the Commission. The net result is that many viewers in isolated communities who now depend on WCYB-TV for service would be wholly unable to receive its signal. That would particularly be the case for viewers who now receive a viewable, if less than perfect picture from the station. Owing to the well-known "cliff effect" associated with DTV reception, most such viewers are likely to receive no DTV signal at all.

Fortunately, there is a solution for this problem. As demonstrated in Mr. Cohen's Engineering Statement, it is possible

to pair Channel 9 with WCYB-TV in the DTV Table, in lieu of the Channel 23 allotment previously proposed. Careful antenna design and installation will permit WCYB-TV to broadcast on Channel 9 without causing interference to any other station. Appalachian is prepared to accept a Channel 9 allotment conditioned upon a required showing that appropriate protection will be afforded to other co-channel stations. See Engineering Statement, p. 4.

A Channel 9 allotment would not only permit Appalachian to provide a far better signal to its viewers, but it would also permit the station to operate more efficiently and thus concentrate its resources on continuing to provide a strong, community-oriented service to its viewers.[1] WCYB-TV would be able to use a far less expensive transmitter operating on Channel 9 than would be required for the three megawatt operation specified for Channel 23, and the station's power bill would also be materially lower. All of these resources would better be

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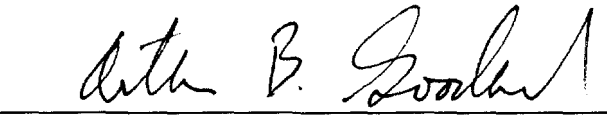
[1]WCYB-TV is very strongly relied on for local news and information by viewers in its market. Its weekday local news broadcasts at noon, 5:30 p.m. 6:00 p.m. and 11:00 p.m. achieve audience shares ranging from 37% to 43% of total television station and cable channel viewing in the station's DMA, and its 6:00 a.m. news achieves a 64% audience share. Nielsen Station Index, Viewers in Profile, Tri-Cities, Tennessee-Virginia, July, 1996.

devoted to maintaining the quality of WCYB-TV's program service, which would be an added benefit of a Channel 9 allotment. We stress, however, that the primary and critical reason the allotment should be made is its necessity in order to permit the station to continue to provide a viewable signal to many viewers who can receive the station's Channel 5 signal today, but who would be unable to receive any viewable signal if WCYB-TV were required to broadcast on a UHF channel.

Accordingly, for the reasons set forth above, Appalachian respectfully requests that the Commission include Channel 9 as the DTV channel paired with WCYB-TV in the DTV Table of Allotments.

Respectfully submitted,

APPALACHIAN BROADCASTING CORPORATION

By: 

Arthur B. Goodkind

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November 22, 1996

Jules Cohen, P.E.
Consulting Engineer

ORIGINAL

**ENGINEERING STATEMENT ON BEHALF OF
APPALACHIAN BROADCASTING CORPORATION
IN SUPPORT OF COMMENTS
SIXTH FURTHER NOTICE OF PROPOSED RULE MAKING
MM DOCKET NO. 87-268**

This engineering statement was prepared on behalf of Appalachian Broadcasting Corporation, licensee of television broadcast station WCYB-TV ("WCYB"), Bristol, Virginia, in support of comments directed to the Sixth Further Notice of Proposed Rule Making in the matter of Advanced Television Systems and Their Impact on the Existing Television Broadcast Service. The statement is directed specifically to a request by WCYB that channel 9 be allotted to Bristol and assigned to WCYB for use in the digital broadcast service.

The present NTSC operation of WCYB-TV is on channel 5 with peak visual effective radiated power of 83.2 kilowatts and height above average terrain of 680 meters transmitting from a site on Holston Mountain. In Appendix B to the Sixth Further Notice, the Commission has proposed that channel 23 be assigned to WCYB-TV with average effective radiated power of 3131.7 kilowatts and height above average terrain of 680 meters. The Commission notes in Appendix B that the calculated percent of replication of the WCYB-TV present service area is only 91.2 percent. In consideration of the nature of the terrain within the WCYB-TV service area, the calculated coverage on channel 23

may well be less than actual coverage despite the assumption of more than 3000 kilowatts of effective radiated power.

WCYB-TV operates in a part of the country that is one of the most difficult to serve by over-the-air television because of the irregularity of terrain prevailing throughout the region. To illustrate the nature of the problem, a series of twelve terrain profiles originating at the WCYB-TV transmitting site and extending for 100 kilometers on bearings spaced 30 degrees apart, is included herein as Figure 1. Since the majority of people live in valley areas rather than on the peaks of mountains, the profiles illustrate that the ideal "line-of-sight" situation for television reception is available in only a limited number of locations. Most locations have to receive off-air signals by diffraction, *i.e.* the signal rays must be bent over obstacles in their paths to reach points of reception. Unfortunately, diffraction produces a substantial loss in signal and that loss increases with frequency. To even approximate the ability of WCYB-TV to provide the type of "fill" behind terrain barriers provided by channel 5, as low a frequency as feasible must be sought.

The lowest channel that offers a possibility for digital use by WCYB is nine, contingent upon the ability to protect existing NTSC operations. Two cochannel NTSC stations require particular attention: WSOC-TV, Charlotte, North Carolina, and WSWP-

TV, Grandview, West Virginia. WSOC-TV, operating with peak visual effective radiated power of 316 kilowatts and height above average terrain of 359 meters, is 181.5 kilometers from WCYB-TV on a true bearing of 136.2 degrees. WSWP-TV, a noncommercial television broadcasting station operating with peak visual effective radiated power of 316 kilowatts and height above average terrain of 305 meters, is 188.9 kilometers from WCYB-TV on a true bearing of 31.4 degrees.

Whereas terrain irregularity is a hindrance to providing service, it is a definite assistance in the avoidance of interference. Terrain profiles in the general direction of the two stations requiring protection show high ridges on the paths from WCYB-TV toward the Grade B coverage areas of both WSOC-TV and WSWP-TV. Those ridges, by themselves, would not provide sufficient attenuation to protect the two stations if the approximately 35 kilowatts average power needed for WCYB to replicate its NTSC service were directed toward them. However, by the use of a directional antenna in the azimuthal plane and appropriate beam tilting, the interfering signal can be suppressed sufficiently so that, when supplemented by terrain blockage, WSOC-TV and WSWP-TV Grade B coverage would be protected.

The design objective for a WCYB-TV antenna for the digital service was to direct as little energy as feasible toward the ridge tops on the paths to WSOC-TV and WSWP-

TV. The antenna needs suppression by the azimuthal pattern of about 15 dB from the main beam and another approximately 4 dB provided by the vertical plane pattern suppression. Preliminary studies indicated that an antenna with a roughly cardioid-shaped azimuthal pattern, 1.5 degrees electrical beam tilt, and an additional 1.5 degrees mechanical beam tilt toward the protected area would accomplish the desired objective.

An antenna manufacturer was provided with the desired specifications and a determination was made that such an antenna can be designed and constructed. The antenna would be a panel type with four elements around the tower and twelve stacked bays.

The allotment of channel 9 to Bristol, and its assignment to WCYB-TV, can be made with the express condition that a showing will be required at some future date that appropriate protection to the NTSC operations of WSOC-TV and WSWP-TV will be afforded during the transition period. After the transition period, when television broadcasting is all digital, if the option is available, WSOC-TV and/or WSWP-TV may choose to return to channel 9 for digital operation. Since the desired-to-undesired ratio for the avoidance of interference between digital television stations is approximately 15 dB lower than what is required to avoid interference from digital television to NTSC

television, the potential for interference from WCYB-TV would be less in the all-digital world.

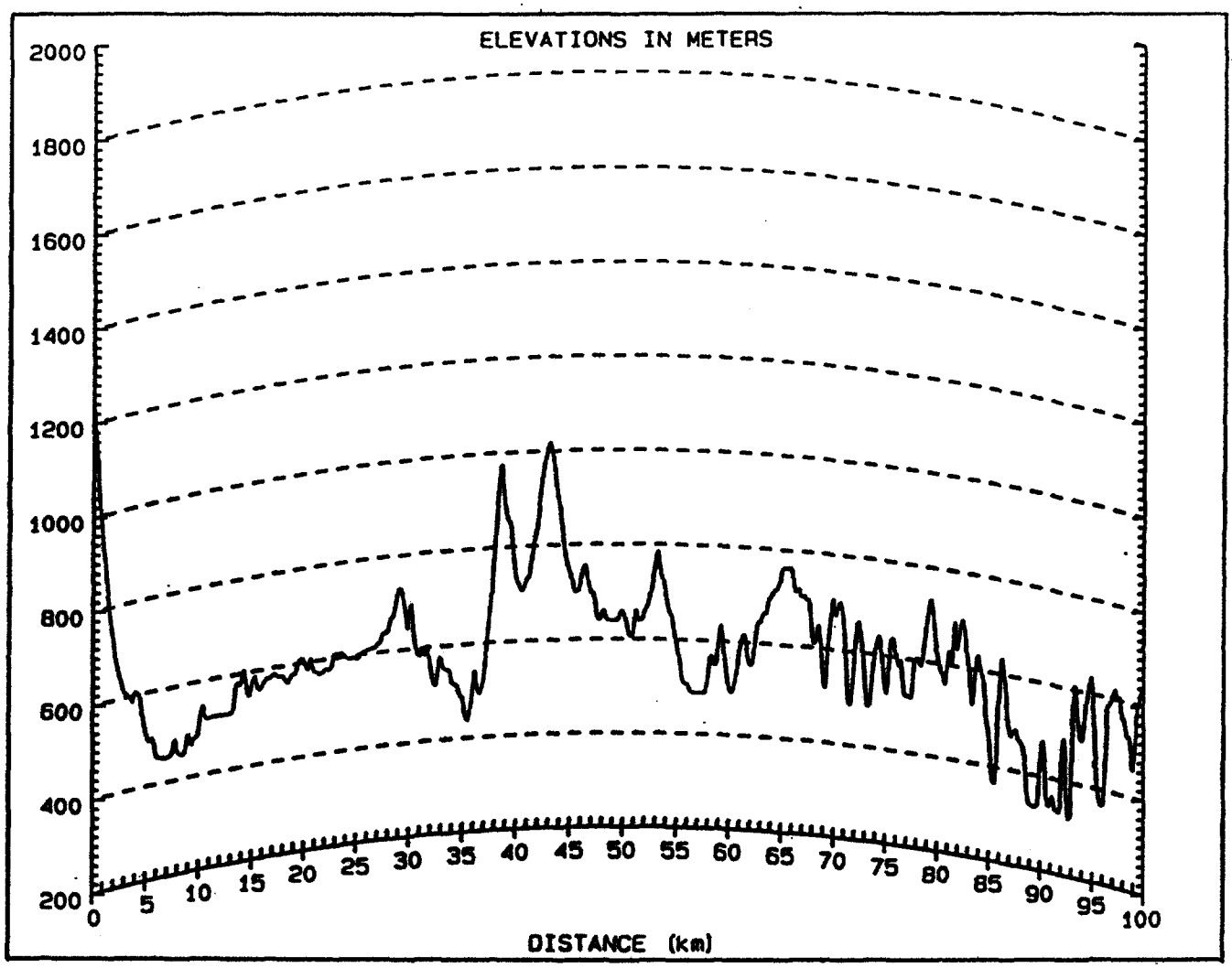
Although the cochannel desired-to-undesired ratio for digital to digital is about 13 dB greater than the same ratio for NTSC to digital, the lesser power requirement for the digital service would be expected to compensate. The trade-off between desired-to-undesired ratio and power should mean that WCYB-TV would suffer no more interference after the transition than during the transition period.

The use of channel 9 rather than 23 by WCYB-TV provides a more efficient use of resources. A transmitter using far less power would be required, thus limiting energy consumption to provide what would be expected to be better service than could be afforded on channel 23.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on November 15, 1996.

Jules Cohen, P.E.



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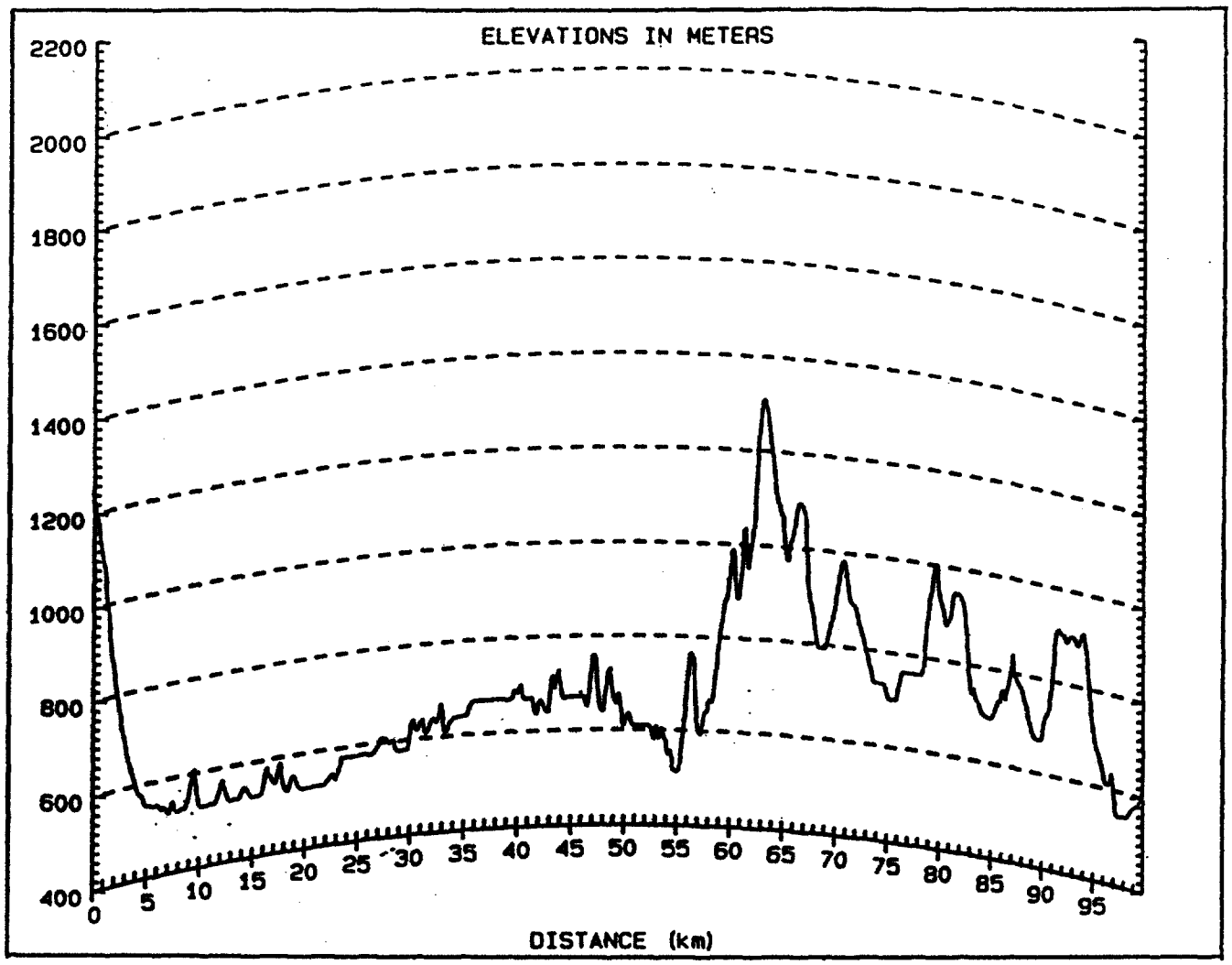
WCYB-TV, BRISTOL, VIRGINIA

Jules Cohen, P.E. Consulting Engineer



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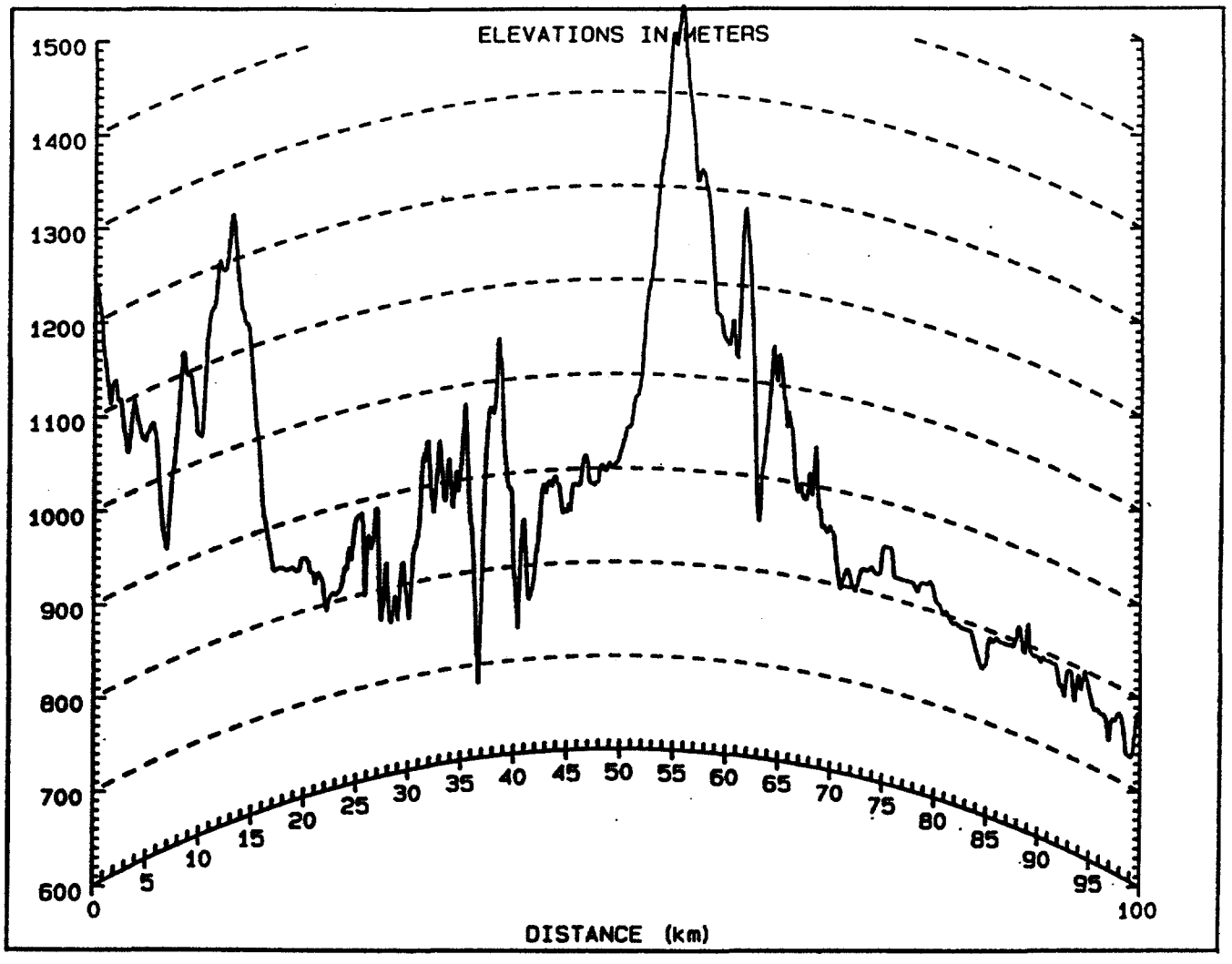
WCYB-TV, BRISTOL, VIRGINIA

Jules Cohen, P.E. Consulting Engineer



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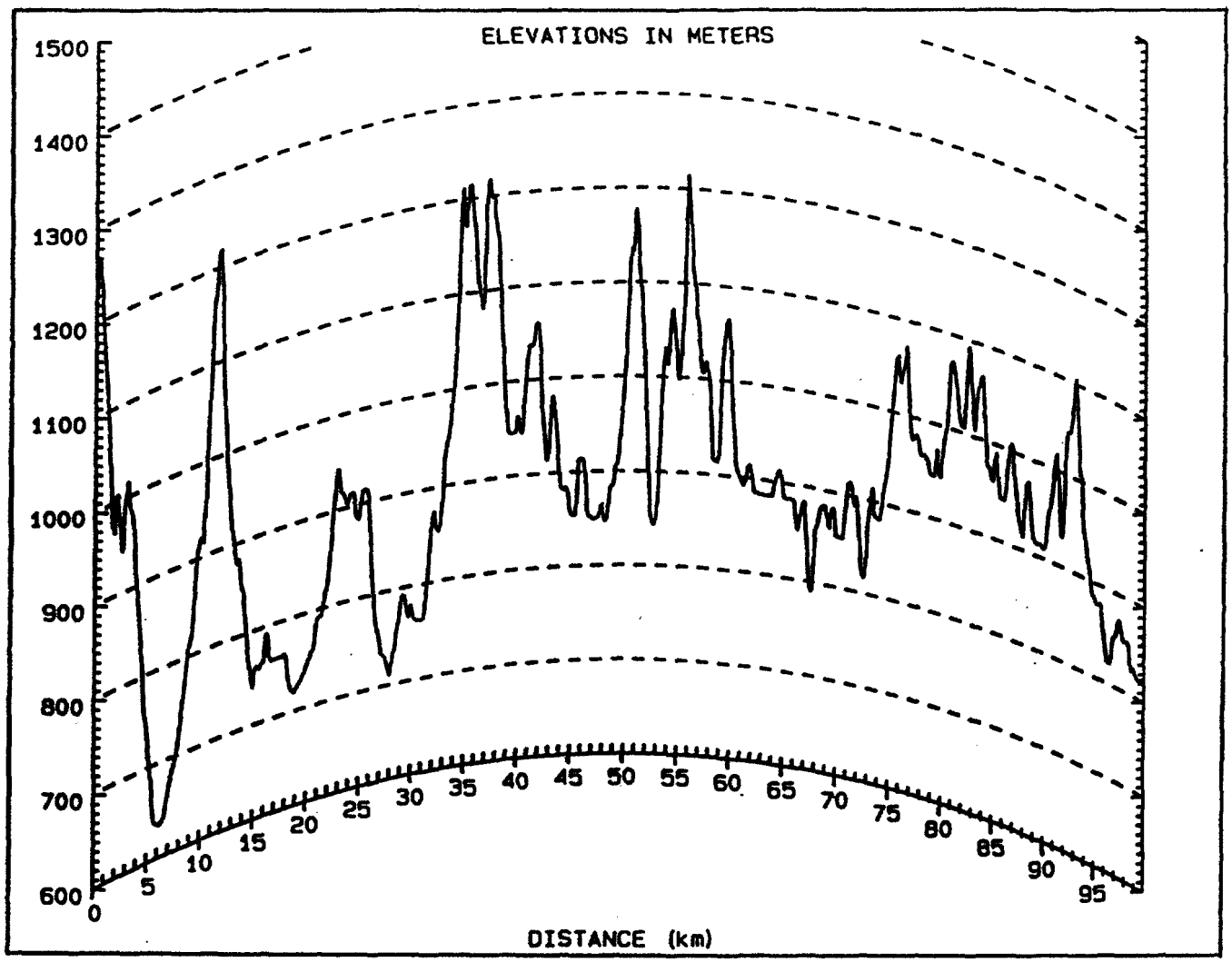
Jules Cohen, P.E. Consulting Engineer



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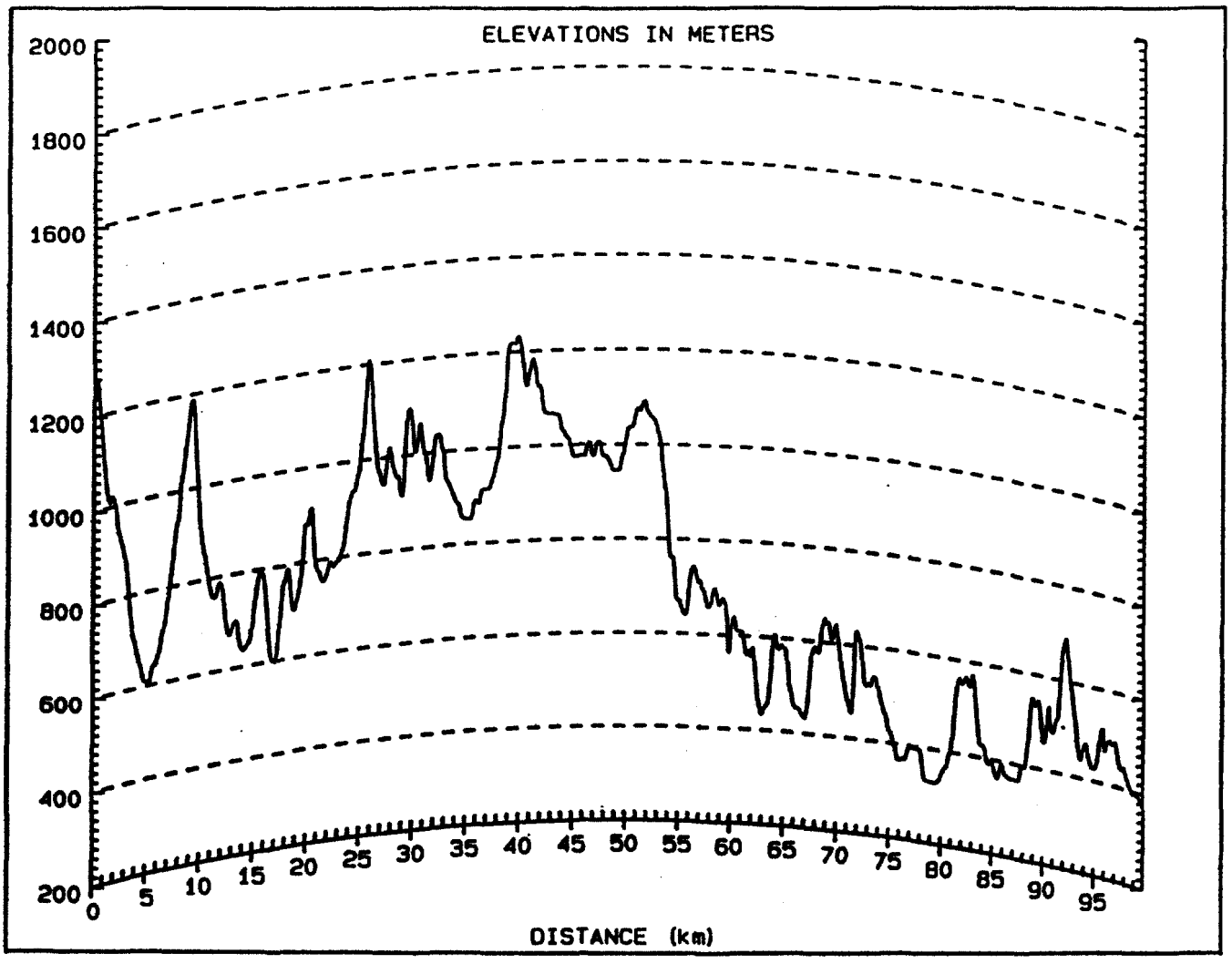
Jules Cohen, P.E. Consulting Engineer



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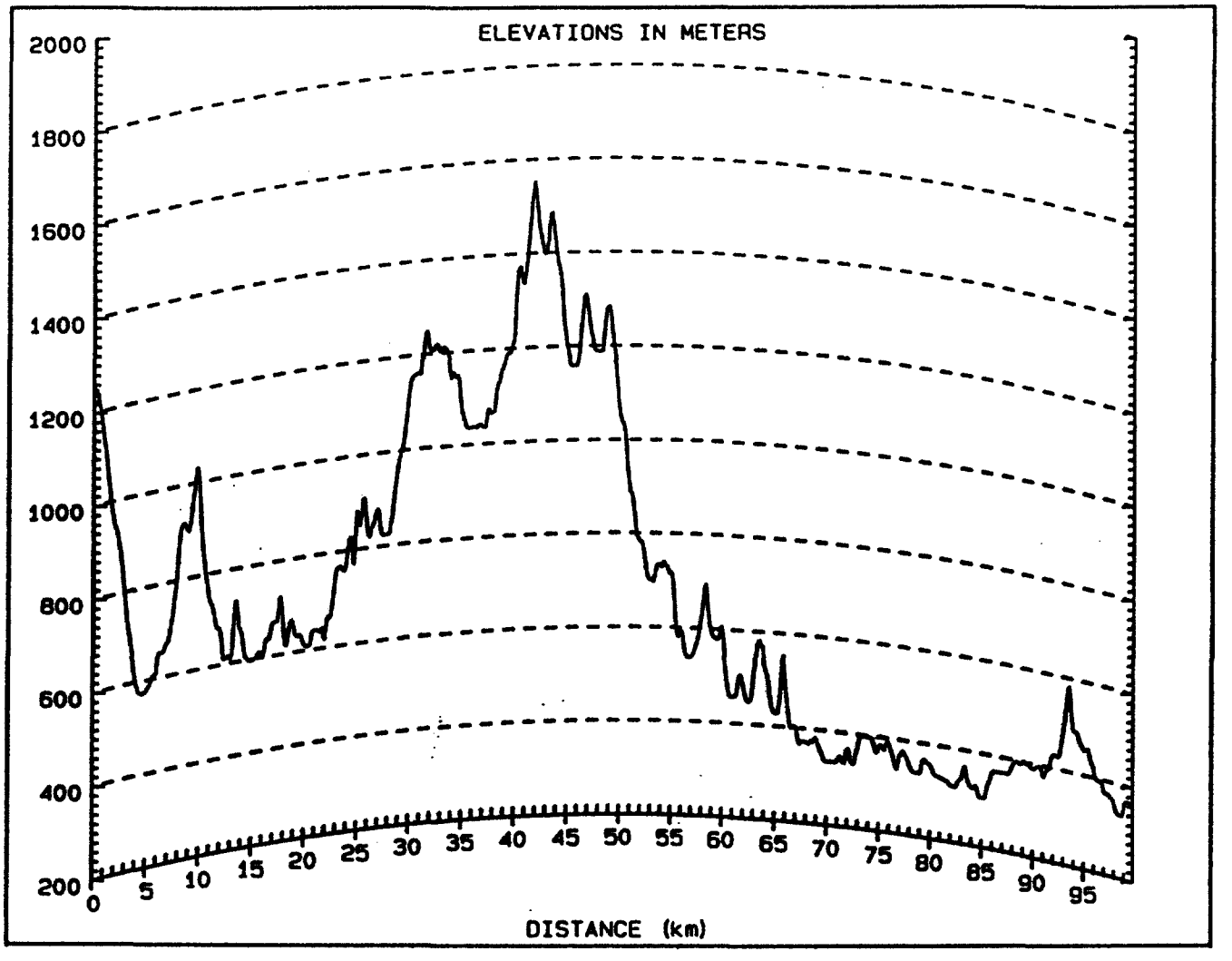
WCYB-TV, BRISTOL, VIRGINIA

Jules Cohen, P.E. Consulting Engineer



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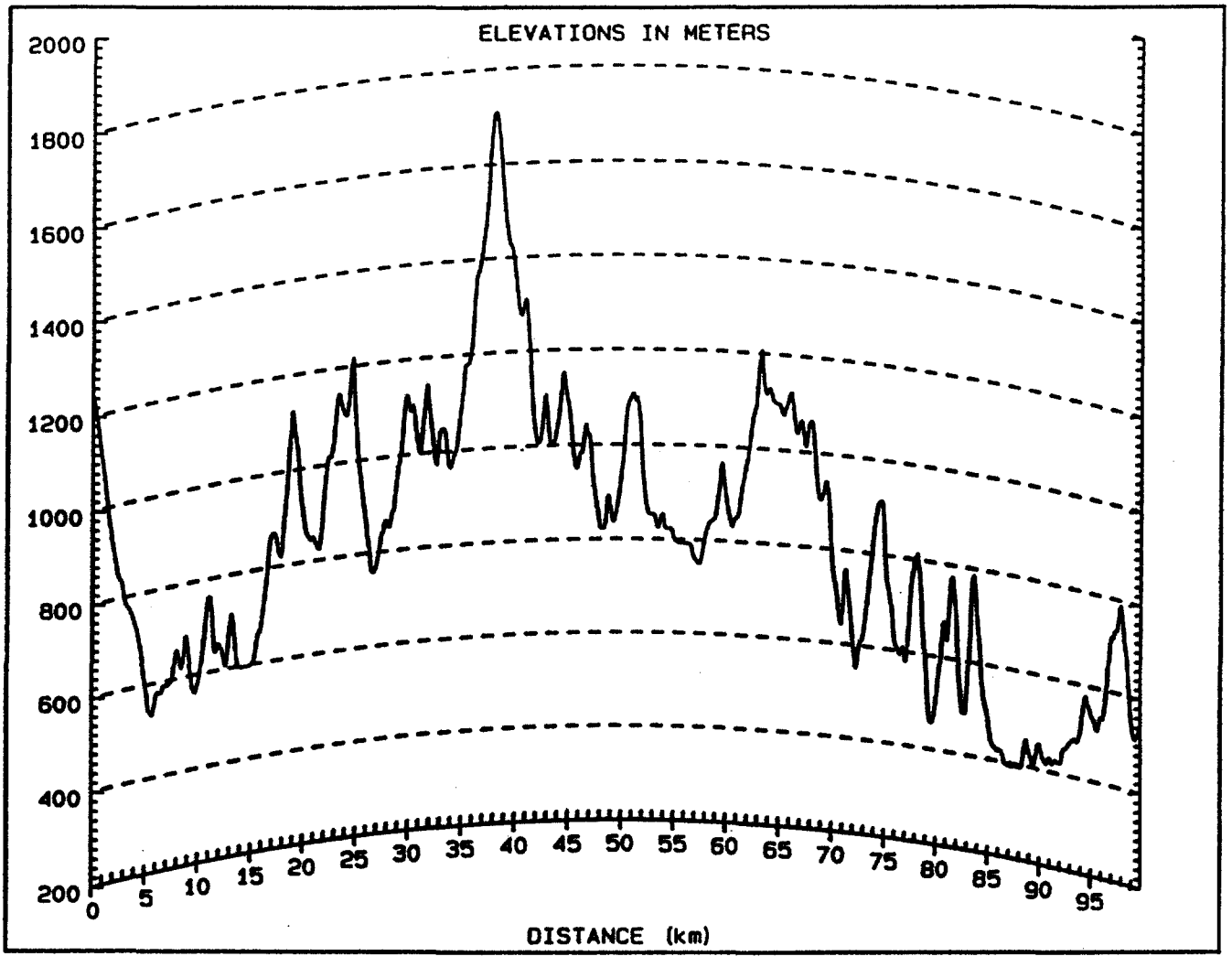
WCYB-TV, BRISTOL, VIRGINIA

Jules Cohen, P.E. Consulting Engineer



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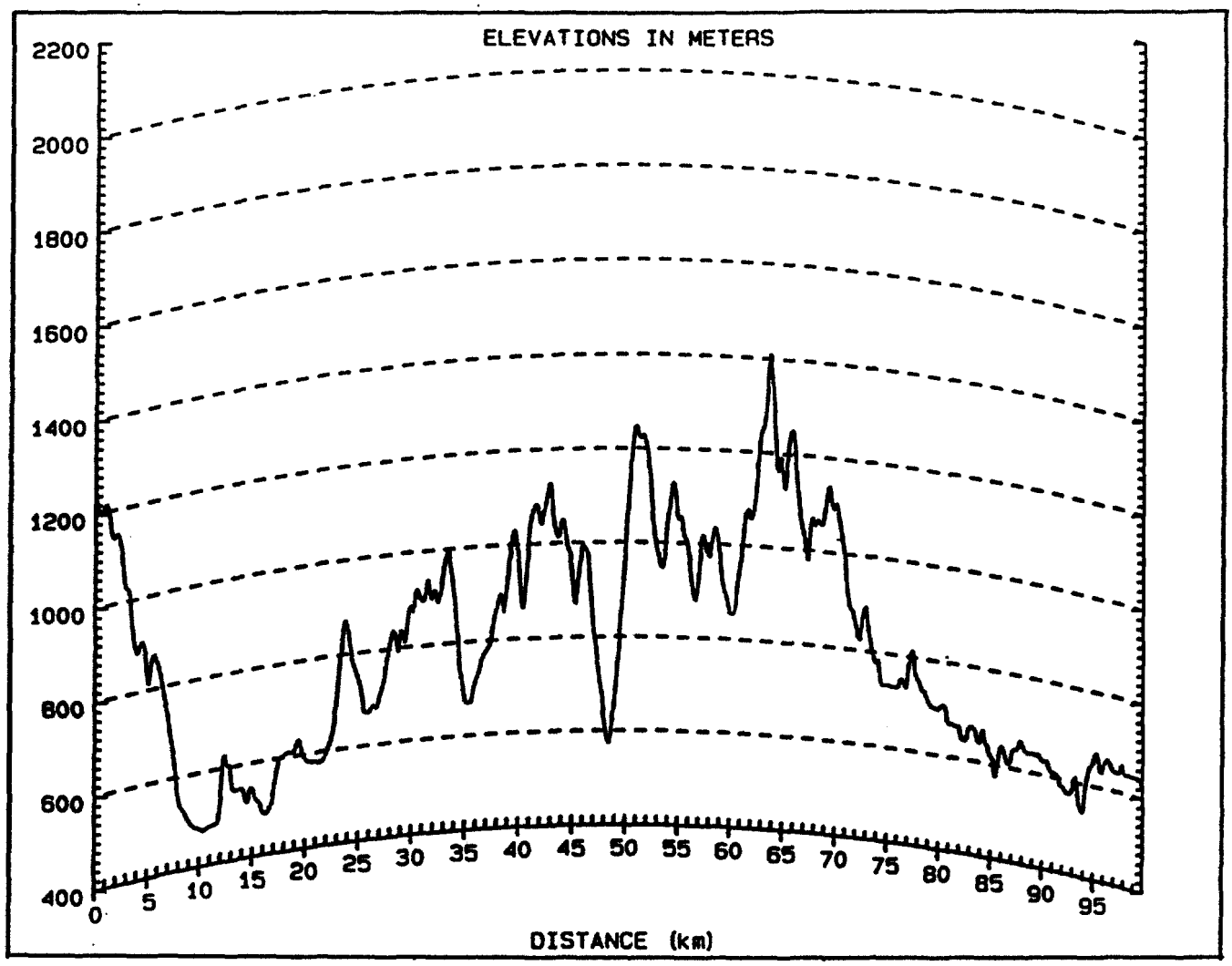
WCYB-TV, BRISTOL, VIRGINIA

Jules Cohen, P.E. Consulting Engineer



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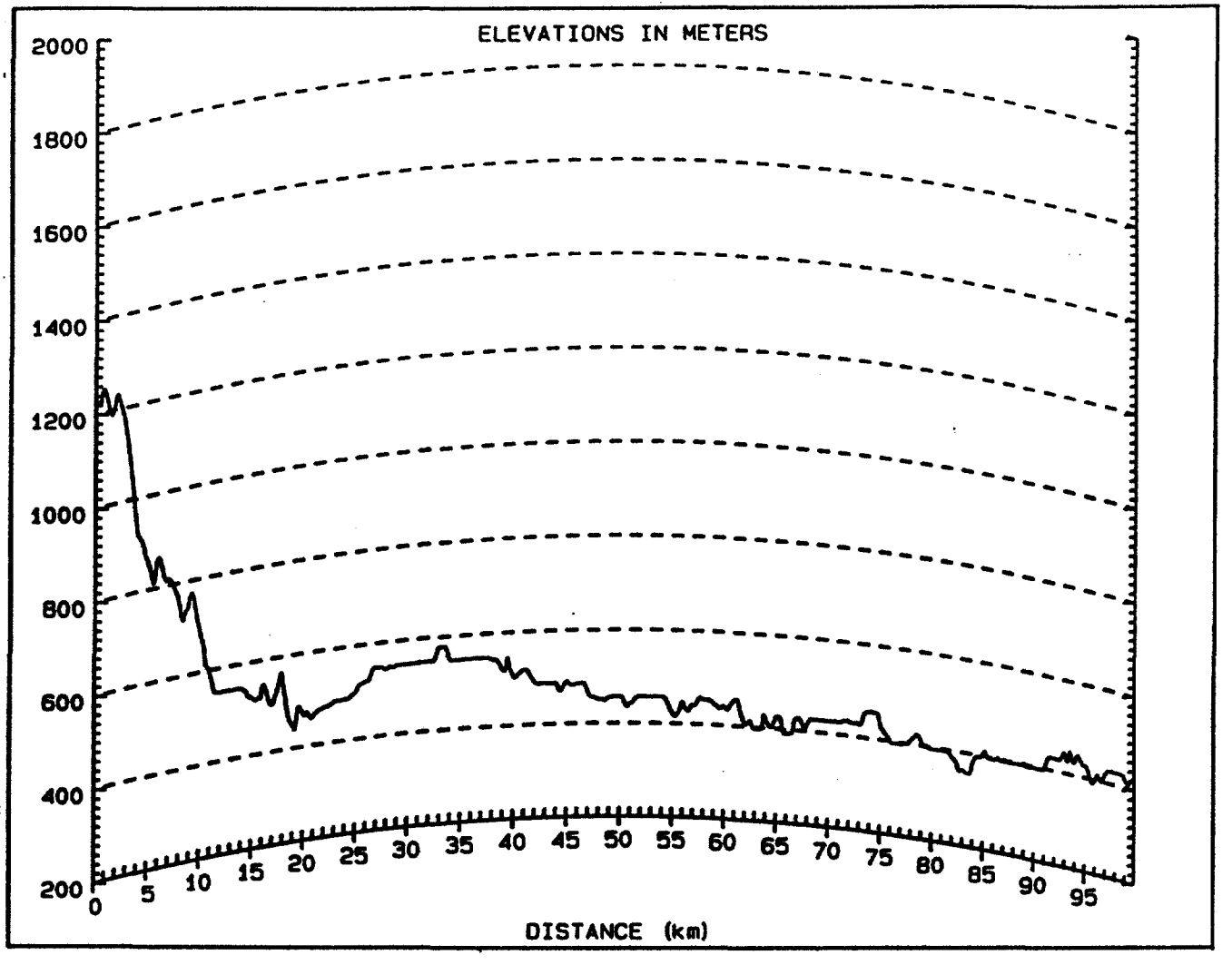
WCYB-TV, BRISTOL, VIRGINIA

Jules Cohen, P.E. Consulting Engineer



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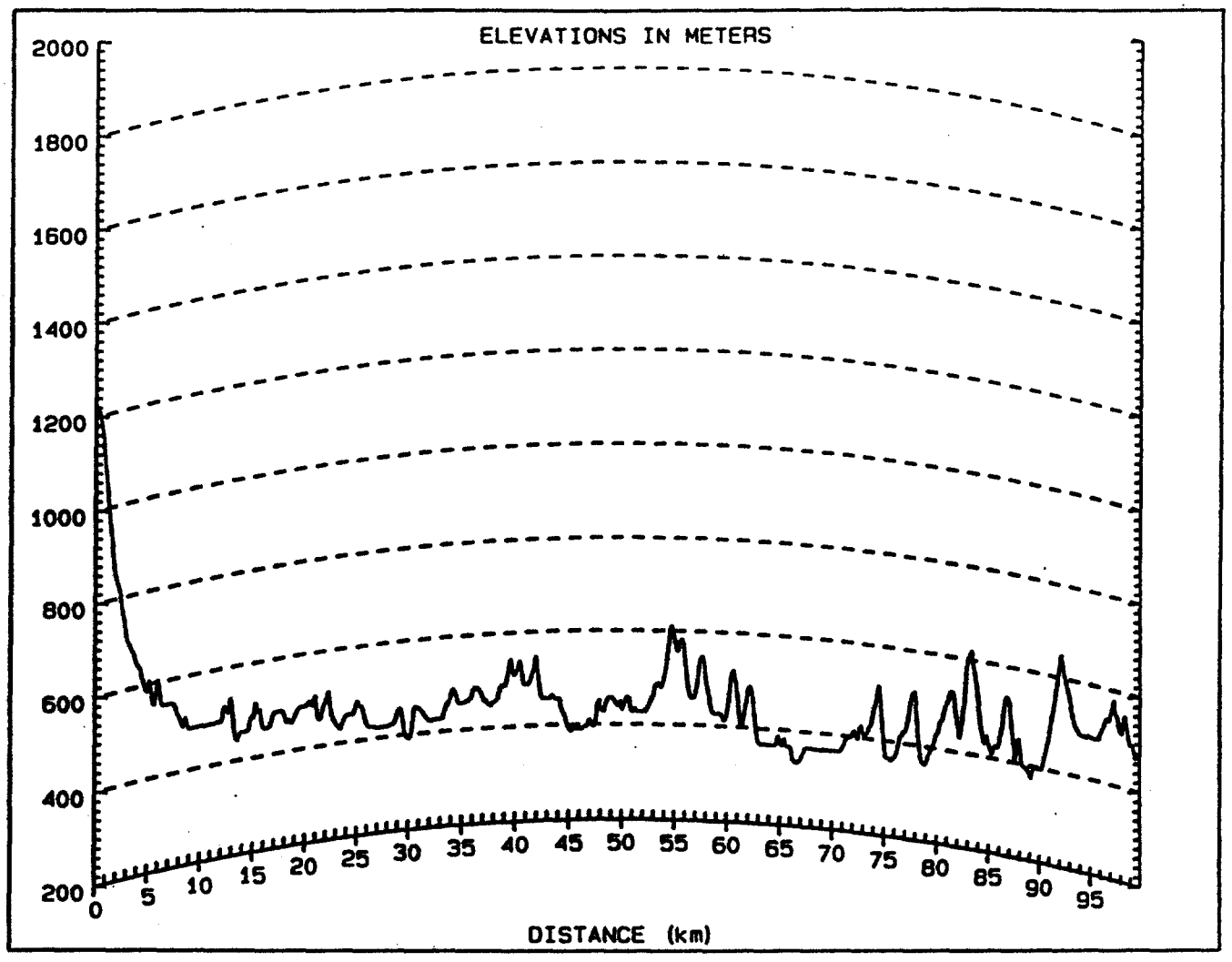
Jules Cohen, P.E. Consulting Engineer



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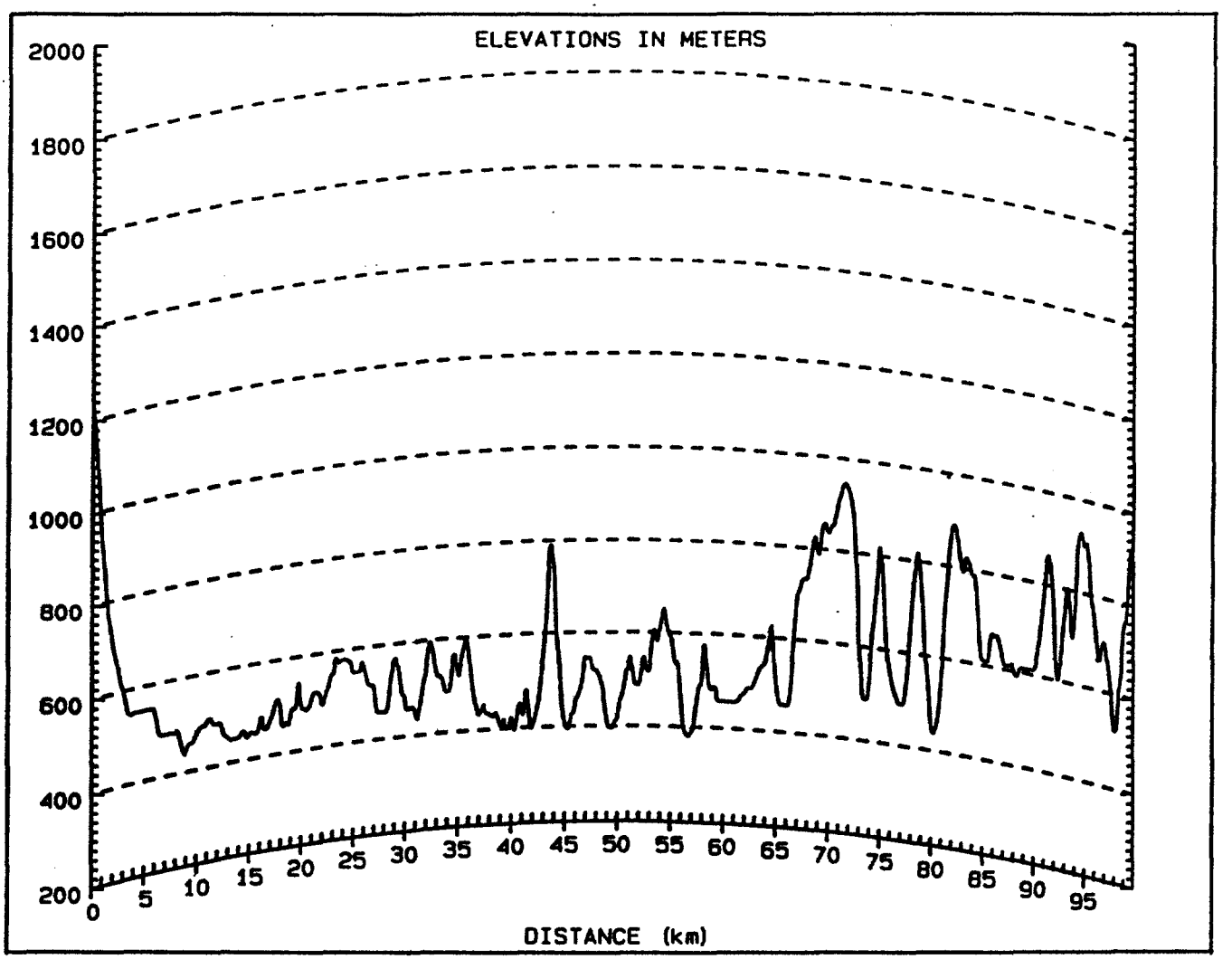
Jules Cohen, P.E. Consulting Engineer



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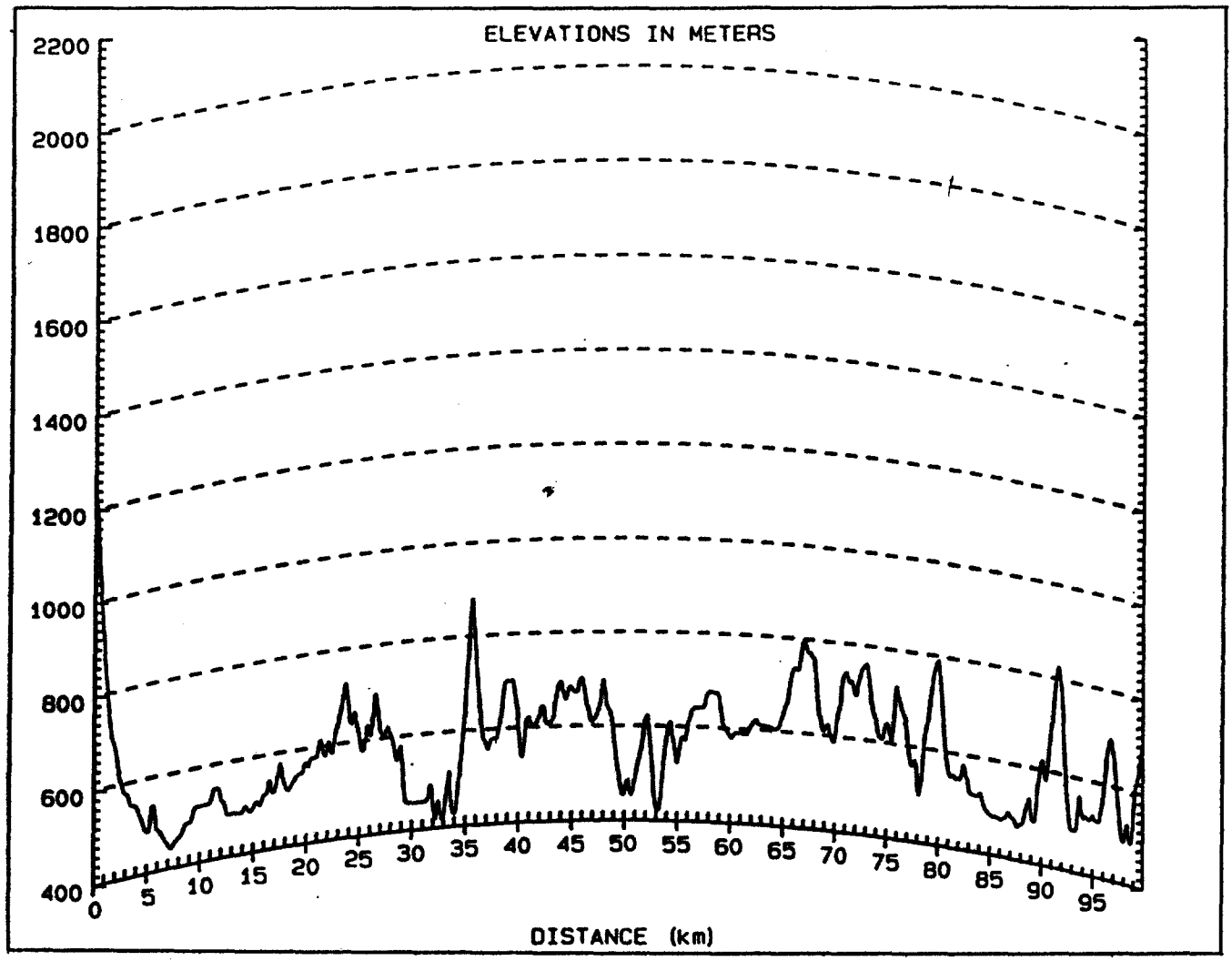
Jules Cohen, P.E. Consulting Engineer



TERRAIN PROFILE AT 330° TRUE
WCYB-TV, BRISTOL, VIRGINIA

Jules Cohen, P.E. Consulting Engineer